

REMARKS

The previously-pending claims 33-71 have been canceled from this application. New claims 72-82 have been added. Therefore, claims 72-82 are now pending in this application.

The previously-pending claims had been rejected as being unpatentable over UK Patent Application GB 2,072,516 to Simpson in view of European Patent Application 0252890 to Söderberg et al. Applicants respectfully submit that the newly-presented claims are patentable over this combination of references and over the other art that is of record in this case.

In applicants' method, a mask body is provided that comprises a filtration layer and that has an opening through which exhaled can pass without having to pass through the filtration layer. An exhalation valve is attached to the mask body at this opening. The attached exhalation valve has only one flexible flap and has only one stationary portion. The flap further includes only one free portion and a peripheral edge that has a stationary segment that is associated with the stationary portion of the flap and a free segment that is associated with the one free portion of the flap. The valve also has a valve seat that includes a flap-retaining surface, a seal surface, and an orifice. The orifice comprises a plurality of openings through which exhaled air may pass to lift the free portion of the flexible flap away from the seal surface during an exhalation. The flexible flap is attached to the valve seat at the flap-retaining surface and makes contact with the seal surface when the flap is in its closed position. The flap attachment and contact with the seal surface is such that the flap exhibits a curvature when viewed from a side elevation and such that a bias is created that enables the flap to provide a leak-free seal to the seal surface under any orientation of the valve.

Applicants' invention is patentable because the prior art does not teach or suggest applicants' step of attaching an exhalation valve to the mask body where the flexible flap has only one free portion that exhibits a curvature over the orifice area and that is biased toward the seal surface to create a leak-free seal under any orientation of the mask body.

The '516 UK patent application to Simpson discloses a cantilevered valve in Figure 2:

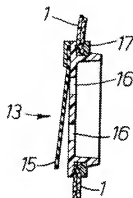


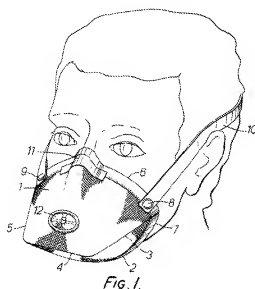
FIG. 2.

Simpson teaches attaching this valve to a mask body. As is apparent, however, the Simpson flap is not curved in its closed position when a fluid is not passing through the orifice. The Simpson flap also is not biased to create a leak-free seal to the valve seat. In fact, Simpson recognizes this deficiency in its valve construction:

To prevent the inhalation of harmful atmosphere owing to leakage of the of each valve, the valve may be provided with an antechamber so arranged that, if the valve does leak in operation, the wearer inhales previously exhaled breath and not the harmful atmosphere.¹

Thus, Simpson overcomes the difficulty in keeping the valve closed by providing an antechamber on the filtering facepiece. As is also seen in Figure 1, Simpson mounts the valve to the top of its duck-billed masks:

¹ See UK Patent Application GB 2,072,516 to Simpson at page 1, lines 58-64.



In this position, gravity can assist in keeping the valve flap closed. Accordingly it is apparent that Simpson does not appreciate applicants' invention or the benefits that are achieved from its structure. Simpson suggests a solution (providing an antechamber) that is different from applicants' claimed method. As such, Simpson would have lead a person of ordinary skill away from applicants' invention.

The '890 European patent application to Söderberg does teach the benefit of having a flexible flap pressed against the seal surface but it too achieves this result in a manner different from applicants' invention. Söderberg states that "the rubber material is resilient and if the membrane is given a beveled edge 12, it will seal against the border 3 of the valve seat in a closed position, irrespective of the position assumed by the valve device."² Thus, Söderberg asserts that a good seal can be achieved by providing the valve membrane with a beveled edge. In this regard, Söderberg does not teach or suggest applicants' method or the benefits that are provided by it, but like Simpson leads a person of ordinary skill away from applicants' invention.

² See European Patent Application 0252890 to Söderberg at page 4, lines 14-23

In short, the record shows that the cited references each took very different approaches to purge exhaled air and prevent inward air leakage. Simpson used an antechamber, and Söderberg uses a beveled edge flap. As such, these references would not have suggested applicants' invention to a person of ordinary skill within the meaning of 35 USC § 103.

Respectfully submitted,

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